

**BARK BEETLE
SURVEY REPORT**

UBC OKANAGAN CAMPUS GROUNDS

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PINE BEETLE SURVEY REPORT - UBC OKANAGAN

A pine bark beetle survey was carried out on UBC Okanagan Campus forest areas including the forested eastern portion of Endowment Land during January 24 - 27, 2017. Pine trees including those around buildings were examined for new beetle attacks following the 2016 bark beetle flights. Douglas-fir trees were also examined. This report provides survey methodology, survey results and recommendations for control.

Survey Method

A walk through survey was done looking for any signs of foliage color change and evidence of new attack on pine and fir tree stems. Trees showing foliage color change as well as stems of trees with insect evidence such as pitch tubes, boring frass or woodpecker activity were checked for beetles by removing some bark and looking for insect evidence such as galleries, adult beetles and larvae. Galleries and insects were observed to determine if they were Western pine beetle (WPB) or Mountain pine beetle (MPB) and recorded. Similarly, Douglas-fir trees were checked for Douglas-fir beetles (DFB) attack. All pine and fir trees around infested trees for a minimum distance of 15 meters were closely examined for signs of beetle attack to ensure all infested trees were identified and marked for removal. All pine trees around buildings including trees with verbenone repellent pouches were closely examined as well.

Yellow flagging tape was placed around the boles of currently infested and older attacked trees. The numbers of attacked trees as well as diameter range and average diameters were recorded. Attack sites were plotted on a map. The number of attacked trees were noted on orange flagging tape and placed on a tree along with yellow tape at each currently infested site. In many instances, the sites were flagged with orange tape to a road, trail or forest edge and tie points established with orange and yellow tape.

Bark Beetles Observed

The survey indicated that WPB are still attacking some trees but the numbers of trees attacked are the lowest since the surveys commenced in 2006. The 2016 Lindgren funnel trapping for western pine beetles resulted in almost double the numbers collected in 2015 but still comparatively low when considering the numbers collected in each prior years. A few Douglas-fir trees were attacked by DFB this year for the first time. There were no MPB or red turpentine beetles (RTB) attacks observed during this survey.

Many of pine trees appear very stressed. They have some thinning and browning foliage and appear like they may have been attacked by pine beetles but there was no evidence of beetle attack on the tree stems. The majority of the attacked pines had little or no evidence of attack on the stems. The trees had to be examined very closely and in a lot of cases bark had to be removed to confirm that the trees were infested. It is possible that some trees could be infested higher up. Trees with significant browning due to needle disease may have secondary bark beetles such as Ips beetles attacking the weakened branches causing additional branch mortality.

Verbenone Repellent Usage

There were 200 verbenone repellent pouches placed on high value aesthetic trees around campus buildings and other important areas last summer. The trees with pouches and

surrounding trees were closely examined during this survey. None of the repellent treated trees were attacked. The repellent use has been effective.

Present Infestations

Fifteen pine trees at seven sites were marked and recorded as having western pine beetle infestations. Many of the trees were older attack with red foliage that likely have some current beetle adults and larvae remaining in the trees. Two trees had green foliage with high level of WPB population. Attacked tree numbers ranged from 1 to 8 per site with an average of 2 per site. The attacked tree diameters ranged from 13 to 31cm with average of 20 cm.

Three Douglas-fir trees were marked and recorded as Douglas-fir beetle infestations. This is the first year that fir beetle attack has been observed on Campus. Douglas-fir beetle populations have been increasing in various parts of the province in recent years. The trees were at two north sites with tree diameters ranging from 25 to 34 cm and averaging 30 cm. One site with two stems is located within the Campus Study Area but do not have any identification tags on them.

Refer to the attached data table and map for infestation details and locations.

Summary

Pine beetle populations appear to be declining significantly. Fifteen trees were attacked by WPB in 2016, the lowest number recorded since surveys commenced in 2006 and less than the thirty-four recorded in 2015. The previous lowest number was twenty-two in 2014. The infestations are from WPB with no evidence of MPB observed during this survey.

The neighboring properties close to the Campus show very little obvious evidence of pine beetle infestation. Only observed one red foliated tree on the golf course property to the north. The pine beetle population in the area seems to be quite low at the present time.

Douglas-fir beetle infestation was found on Campus for the first time. Three fir trees were found attacked. The insect should not be very problematic in future since Douglas-fir trees are a minority species on Campus.

Refer to the attached history of bark beetle survey results on UBCO Campus.

Recommendations

1. Control the spread of the bark beetles from the infested trees before April 15, 2017 by removing the trees from UBCO property and disposing of the infested portions of the trees in a manner that would destroy the insects prior to beetle flight.
2. Remove the entire infested trees including branches and foliage from the attack sites for fire hazard and aesthetic reasons.
3. Endeavor to ensure neighboring property owners are aware of and are dealing with infestations on their properties prior to beetle flights in order to reduce the risk of insect spread onto UBCO property.
4. Continue monitoring Campus trees and have a bark beetle survey done after 2017 beetle flights.



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PINE BARK BEETLE SURVEY DATA SUMMARY

UBC OKANAGAN - JANUARY 2017

GENERAL LOCATION	SITE	ATTACKED TREES		TREE DIAMETERS (CM)		INSECTS		ATTACK LEVEL	COMMENTS
		PINE	FIR	Range	Avg.	WPB	DFB		
North West	A	1			20	X		M	Older attack. Red foliage. May still have beetles. 25M from trail.
	B	1			25	X		M	Older attack. Full red foliage. May still have beetles. 570 W about 60m from road.
	C	2		18-21	19.5	X		M	One older attack and one bent over green tree with more recent attack. About 12m from road.
	D	8		13-28	18.4	X		H	One 24.6 cm tree with green foliage and high attack level. Other seven trees are older attack with red foliage and may still have pine beetles.
North Central	E		2	25-31	28		X	M	Douglas-fir tree with two stems joined, 5M from ground. Within UBCO study area and about 18m from Golf Course. No tags on tree. Fair access.
	F	1			13	X		M	Bent over tree with red foliage and current beetle population. Located beside an access trail.
North East	G		1		34		X	M	Douglas-fir tree with much of the foliage off on upper portion. Located near a road.
South West	H	1			36	X		M	Older attack. Tree located about 12m East of Natural gas site. No current beetles seen.
	I	1			21	X			Older attack. Tree has red foliage. Easy access.
TOTALS		15	3						

LEGEND

- G - Trees with current beetle populations
- R - Red foliage trees - No current beetles.
- M - Moderate attack level
- H - Heavy attack level

HISTORY OF BARK BEETLE SURVEY RESULTS ON UBCO

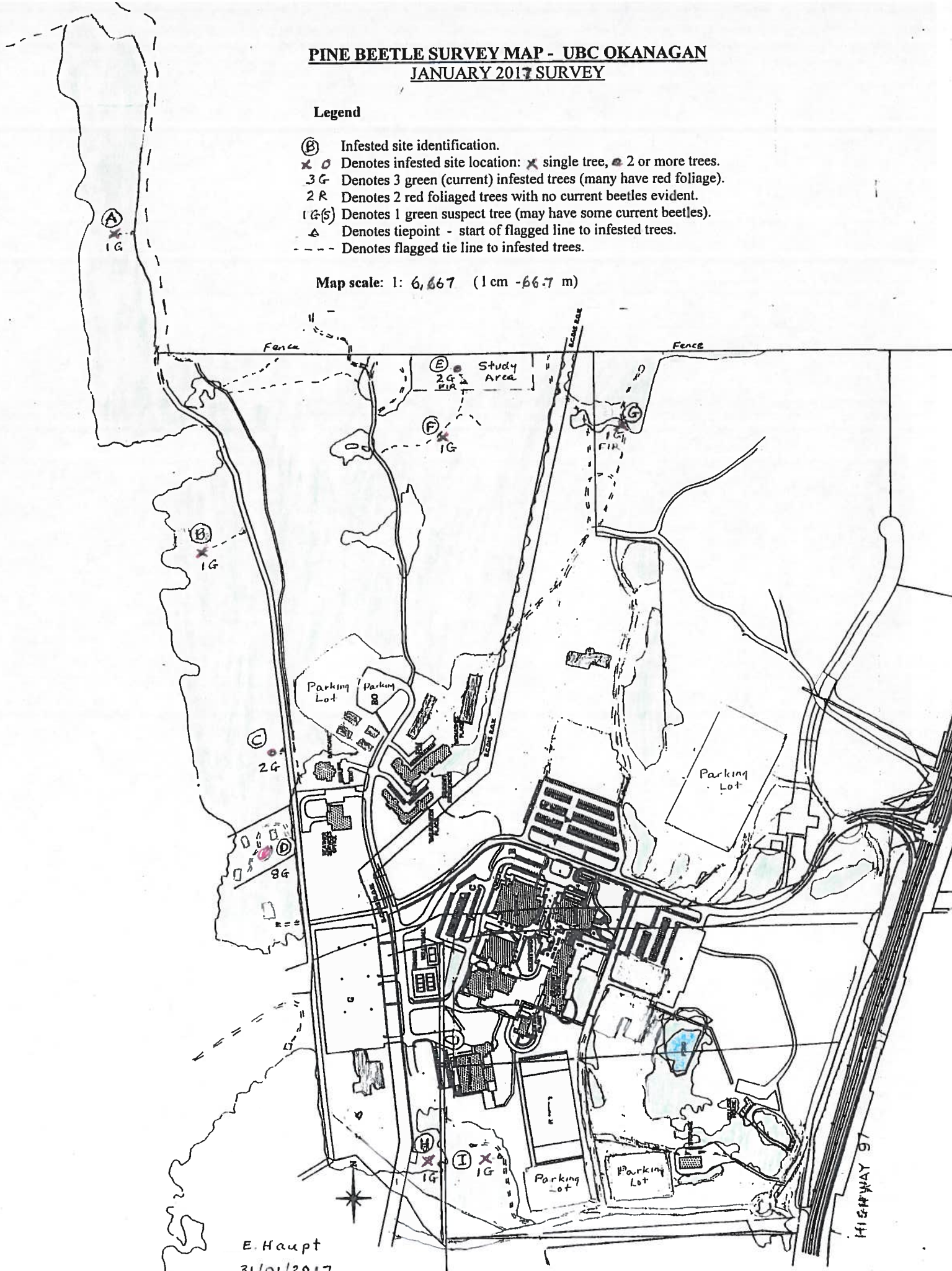
<u>YEAR</u>	<u>ATTACKED PINE TREES</u> <u>(WPB AND MPB)</u>	<u>ATTACKED FIR TREES</u> <u>(DFB)</u>
2005	126 (also 139 old attack)	0
2006	168	0
2007	347	0
2008	357	0
2009	349	0
2010	263	0
2011	483	0
2012	156	0
2013	67	0
2014	22	0
2015	34	0
2016	15	3
TOTALS	2,387 (also 139 old attack)	3

PINE BEETLE SURVEY MAP - UBC OKANAGAN
JANUARY 2017 SURVEY

Legend

- (B) Infested site identification.
- x O Denotes infested site location: x single tree, O 2 or more trees.
- 3G Denotes 3 green (current) infested trees (many have red foliage).
- 2R Denotes 2 red foliated trees with no current beetles evident.
- 1G(S) Denotes 1 green suspect tree (may have some current beetles).
- △ Denotes tiepoint - start of flagged line to infested trees.
- - - Denotes flagged tie line to infested trees.

Map scale: 1: 6,667 (1 cm = 66.7 m)



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